indicium **70** can then be employed to read respective markers **10** in parallel, with one reader per marker, as the moving object passes the appropriately situated optical readers.

As an alternative, labeling method, markers **10** may be arranged in a horizontal row on an object as illustrated in FIG. **20**. Again, solely for illustrative purposes, each marker has an orientation different from its adjacent marker in accordance with the FIG. **17** scheme to represent numerals "**1**" through "**0**." This arrangement allows the respective markers to be read serially as the object passes a single optical reader. A symmetrical or bidirectional coding scheme may be used for serial reading to make the system insensitive to the direction of motion.

As a further modification depicted in FIGS. **21–24**, a single marker can be made to accommodate a plurality of digits with an arrangement of concentric rings each having a different graphic bar pattern whose orientation is determined in accordance with a coding scheme such as illustrated in FIGS. **17** and **18**.

In the illustrative arrangement of FIG. **21**, four rings **72, 74, 76** and **78** of decreasing spatial frequency are selected to represent the four digit number "0000." The Fourier transform output signal shown in FIG. **22** includes conjugate loci **82, 84, 86** and **88** which respectively correspond to the input images formed from the graphic bar patterns of rings **72, 74, 76** and **78**. Because the rings decrease sequentially in spatial frequency, the conjugate loci increase in distance from center **89**.

FIG. **23** illustrates an arrangement similar to that shown in FIG. **21** in which respective bar pattern rings **92, 94, 96** and **98** have been oriented to form the four digit number "9162." Like the rings of FIG. **21**, rings **92, 94, 96** and **98** also decrease in spatial frequency. The corresponding transform signals of the input images obtained from patterns **92, 94, 96** and **98** are illustrated in FIG. **24** wherein the conjugate loci **102, 104, 106** and **108** again respectively relate to the graphic bar patterns in concentric rings **92, 94, 96** and **98** but with 90° orientation and increasing distance from origin **110**.

For both examples depicted in FIGS. **21–24**, an apparatus, such as that illustrated in FIG. **16**, but with multiple paired light pipe devices and photodetectors corresponding to all rings in the output plane and all numbers in the rings, may be used to detect the particular codes for conversion into a numerical system. Information from the photodetectors may be fed into a computer and a display, or other information retrieval apparatus, to ascertain the information carried by the codes and the objects to which the coded patterns are affixed.

It is understood that while the foregoing discussion has been in connection with decimal numbers, it would be within the scope and spirit of the invention to apply the teachings included herein to accommodate other numeric systems or codes such as binary numbers as well as to accommodate alphabetic or alphanumeric words.

While preferred embodiments of the present invention have been described hereinabove, it is intended that all matter contained in the above description and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense and that all modifications, constructions and arrangements that fall within the scope and spirit of the present invention may be made.

What is claimed is:

1. An optical system for identifying moving and stationary objects in accordance with an identification system utilizing a plurality of separate codes designating individual and different identification information relating to the objects comprising:

input image means secured to the objects and having identification means depicting one or more of the separate codes for transmission of the information contained therein;

an extended source of spatially incoherent light for illuminating said input image means for providing a spatially incoherent light signal modulated in accordance with the information contained in said input image means;

transformer means in the path of the modulated light signal, including a pair of Fresnel zone patterns having a construction such that said patterns negligibly diffract the modulated light signal, for producing an output image which is the optical Fourier transform of said input image, said Fresnel zone patterns in combination being positioned so as to produce the optical Fourier transform of said input image as the modulated spatially incoherent light signal passes through said Fresnel zone patterns; and

detector apparatus placed in the optical path of the output image for selectively detecting the output image and for obtaining the information contained therein.

2. An optical system defined by claim **1** wherein said identification means comprises a plurality of predetermined patterns of light reflective and non-reflective means corresponding to the separate codes.

3. An optical system defined by claim **2** wherein each of said predetermined patterns of light reflective and non-reflective means comprises a graphic multiple parallel bar pattern having a predetermined fundamental spatial frequency and orientation representing a selected one of the separate codes of the identification system.

4. An optical system as in claim **1** wherein said identification means comprises a plurality of bar patterns graphically representing a plurality of alpha-numeric symbols and having a distinct and different angular orientation for each represented alpha-numeric symbol, said plurality of bar patterns being arranged in a sequentially detected linear array.

5. An optical system as in claim **1** wherein said identification means comprises a plurality of bar patterns graphically representing a plurality of alpha-numeric symbols, said bar patterns having a distinct and different angular orientation for each represented alpha-numeric symbol, and having a distinct and different spatial frequency defining the sequential position of the symbols in a parallel simultaneously detected array of said bar patterns.

6. The optical system defined by claim **1** wherein said detector apparatus comprises a plurality of photo-electric detectors situated in close proximity to said output plane.